

REMARKS

Claims 1-9, 16, 17, 23, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen, US 2003/0164503. Applicant respectfully traverses the rejection. The Examiner states "Chen discloses in Fig. 6B, a semiconductor light emitting device, shown as element 1000, and the layers above it; and a substrate 125 comprising an aluminum ceramic core 120 and at least one metal layer 122 overlying the core Although, Chen does not expressly disclose the layer is copper with a thickness of at least 4 mil., it would have been obvious to one of ordinary skill in the art at the time of the invention to make the adjustments regarding the thickness and material of the layer, in order to accommodate LED devices with desirable sizes on the substrate, and use copper, since copper while being a good conductor, is relatively cheap."

Paragraph 18 of the present application teaches "Metal regions 25 and 29 are often copper, but may be any suitable metal. Metal regions 25 and 29 are thick enough to efficiently conduct heat laterally, generally about 4 mils (101.6 μm) to about 24 mils (609.6 μm).". Page 3, paragraph 35, line 11 of Chen identifies structure 122 as an "ohmic contact[]." Applicants have found no teaching in Chen of the necessity of conducting heat laterally, nor would a person of skill in the art consider lateral heat conduction relevant to Chen's device since the entire lateral extent of the interface between the structures of Chen's Figs. 6A and 6B appears to be conductive, thus heat does not need to be conducted laterally. Accordingly, a person of skill in the art would not be motivated to make structure 122 4 mils thick, since a thinner layer would likely serve the intended purpose of structure 122 (an ohmic contact) and making structure 122 thicker would needlessly increase the cost and complexity of forming the structure of Fig. 6B.

For the above reasons, the Examiner has failed to provide a motivation to modify Chen to result in the structure of claim 1, and claim 1 is thus allowable over Chen. Claims 2-

17, 23, and 24 depend from claim 1 and are thus allowable over Chen for at least the same reason as claim 1.

In addition, claim 2 recites "the semiconductor light emitting device comprises a III-nitride light emitting layer." The Examiner has failed to provide a reasonable expectation that the device of Chen can be successfully modified to accommodate a III-nitride light emitting layer. Claim 2 is thus allowable over Chen for this additional reason.

Claim 4 recites "at least one lead," and claim 6 recites "at least one terminated wire". The Examiner has pointed to no such teachings in Chen, except to say "at least one lead/wire/pad 124 is connected to the layer." Applicant fails to see how one structure in Chen can be three very different structures in different claims. Claims 4 and 6 are thus allowable over Chen for this additional reason.

Claim 7 recites "the at least one copper layer is bonded to the core by a direct copper bond" and claim 8 recites "at least one copper layer is bonded to the core by an active metal braze." The Examiner has pointed to no such teachings in Chen. Claims 7 and 8 are thus allowable over Chen for this additional reason.

Claims 10-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen as applied to claim 1 in view of Raj et al., US 2002/0175339. Applicants respectfully traverse the rejection. Claims 10-15 depend from claim 1. Raj is cited as teaching "a second substrate layer between the copper substrate and the light emitting device." As such, Raj adds nothing to the deficiencies of Chen with respect to claim 1. Claims 10-15 are thus allowable over Raj and Chen for at least the same reason claim 1 is allowable over Chen.

In addition, as Applicant pointed out in the last office action response where the Examiner combined Raj with Akiyama, the Examiner has provided no reason to modify either Chen or Raj to include two substrates. The only motivation stated by the Examiner is "in order to utilize [Chen's] structure in applications such as fiber optics, as Raj reference

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teaches." However, the Examiner has failed to show why *two* substrates, i.e. *both* Chen's substrate and Raj's substrate, are necessary to utilize Chen's device for fiber optics.

In view of the above arguments, Applicant respectfully requests allowance of claims 1-17, 23, and 24. Should the Examiner have any questions, the Examiner is invited to call the undersigned at (408) 382-0480.

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Signature Date

Respectfully submitted,

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